

THREE NEW SPECIES OF *LEPTEUCOSMA* DIAKONOFF (TORTRICIDAE: OLETHEUTINAE: EUCOSMINI) FROM INDIA

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ABSTRACT. Three new species of *Lepteucosma* are described from India: *L. ferruginoptera*, *L. alferdi* and *L. byuni*. We present detailed descriptions of adult morphology, wing venation and external genitalia.

Additional key words: Taxonomy, Genitalia, *ferruginoptera* sp. nov., *alferdi* sp. nov., *byuni* sp. Nov.

Owing to unique characters of the wing venation and male genitalia, Diakonoff (1971) proposed the genus *Lepteucosma* with *L. oxychrysa* Diakonoff as its type-species. *Lepteucosma oxychrysa* was represented by its holotype known only from Gilgit (Kashmir). In addition to the type-species, the genus is represented by seven more species: *L. blanda* (Kawabe) (Thailand), *L. ceriodes* (Meyrick) (Assam, Khasi Hills), *L. huebneriana* (Kocak) (Europe), *L. lutescens* (Razowski) (Afghanistan), *L. oxychrysoides* Kuznetsov (South Vietnam), *L. punjabica* Kuznetsov (India, Dharmshala, Punjab) and *L. siamensis* (Kawabe) (Thailand). While sampling the microlepidopteran fauna of the foot hills of the Himalayas, the authors collected three males and one female of *Lepteucosma*. An examination of the male genitalia revealed three different species that conform with the general ground plan of the genus. Accordingly, we describe these species on the basis of superficial as well as genitalic characters.

Lepteucosma Diakonoff

Lepteucosma Diakonoff, 1971, Veröff. zool. StSamm. Münch, 15:179.

Type-species: *Lepteucosma oxychrysa* Diakonoff, 1971, ibidem, 15:181, text-fig. 6, pl. 2, fig. 6, by original designation.

Labial palpus long, more than twice diameter of eye, second segment long, porrect, strongly expanded with scales above and beneath, third segment small, slightly drooping; male with or without costal fold; forewing with vein R_1 arising very near base of cell, almost in the basal one-fourth, R_4 and R_5 free, M_1 and M_2 almost parallel to each other, M -stem absent; hindwing with R_s and M_1 closely approximated at base, M_2 bent towards lower angle basally, M_3 and CuA_1 stalked; male genitalia with uncus small, bicornuate, tegumen with shoulders rounded, socii moderate in size, drooping, valva strongly constricted in middle, cucullus strongly dilated, hammer-shaped, Aedeagus stout and broad, with or without a sheaf of deciduous cornuti; female genitalia with papillae anales small, slender, corpus bursae large, usually with two unequal signae.

Lepteucosma ferruginoptera Pooni & Rose, new species

Male (Fig. 1). Wing expanse: 19 mm. Vertex light ochreous; frons greyish ochreous. Antenna yellowish ochreous. Labial palpus long, 2.3 times horizontal diameter of compound eye, second segment whitish ochreous, terminally fuscous, expanded with scales on upper and lower side, third segment white, slightly drooping. Thorax covered with pale ochreous and dark fuscous scales. Forewing with costa strongly arched throughout, costal fold extending almost to middle, apex round pointed, termen oblique, slightly concave, tornus obtuse, anal margin straight, ground color whitish ochreous, a large roughly triangular, ferruginous spot on costa immediately distad of costal fold, occupying one half area of wing, anal margin greyish ochreous throughout, with few fuscous scales, a light brown semi spherical spot on apex, continuing as a line along termen, a few black specks and small greyish patches along termen in the posterior half, costal strigulae on costal fold and in middle ill-defined, three postmedian strigulae well defined, last one continuing as white irregular line along termen, fringes with cilia grey, whitish ochreous near tornus, undersurface dark fuscous throughout. Hindwing quadrate, pale ochreous, anal area slightly darker, somewhat greyish, fringes pale-ochreous throughout with a dark sub-basal shade, undersurface pale ochreous. Prothoracic and mesothoracic legs fuscous, metathoracic legs pale ochreous.

Male genitalia (Fig. 7): Uncus small, bifurcate distally, apices dorso-laterally directed; socii moderate, drooping, sparsely hairy; tuba analis membranous; tegumen moderately developed, shoulders rounded; vinculum weak; juxta triangular, shield-like; valva strongly constricted near middle, costa strongly arched, basal excavation large, sacculus rounded, broad, bearing very fine setae, cucullus neck much narrower, strongly dilated at apex, oblique, hammer-shaped, upper lobe somewhat longer, about twice as broad as lower, upper lobe rounded, lower somewhat pointed, inner surface bearing long dense hair, distal margin with small stout setae; aedeagus small, broad, base globular, vesica without cornuti.

Female genitalia: Unknown.

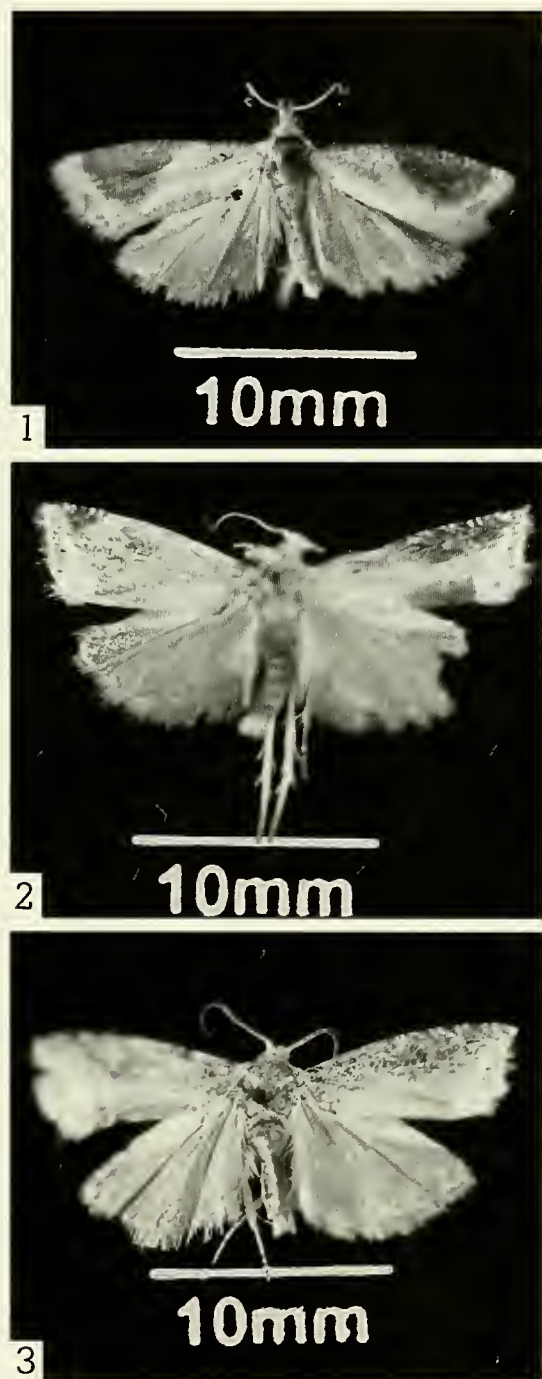
Material examined: Holotype: ♂ India, Himachal Pradesh: Dist. Kangra; Kangra, 500m, 12.vi.1998.

Remarks: *Lepteucosma ferruginoptera* is similar to *L. oxychrysa* Diakonoff (type-species) in having the upper lobe of the cucullus almost twice as broad as the lower lobe. However, it differs in the absence of cornuti in the vesica of the aedeagus, which are present in *L. oxychrysa*. Superficially, *L. ferruginoptera* bears a large, roughly triangular, ferruginous spot on the costa immediately distal of the costal fold in the forewing, occupying about one-half of the wing.

Etymology: The name is proposed on the basis of a large ferruginous spot on the forewing of this species.

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FIGS. 1-3. Adults: 1, *L. ferruginoptera* new species, 2, *L. alferdi* new species, 3, *L. byuni* new species.

Lepoteucosma alferdi
Pooni & Rose, new species

Male, Female (Fig. 2). Wing expanse: 21-22 mm. Vertex covered with dark fulvous scales with greyish tips; frons pale fulvous. Antenna fuscous. Labial palpus long, 2.5 times horizontal diameter of compound eye, dark fulvous, second segment long, porrect, strongly expanded with scales on upper and lower side, third seg-

ment minute, pointed, slightly drooping. Thorax dark fuscous. Wings broad; forewing with costa gradually and gently arched throughout, a little abrupt expansion at basal one-fourth, male with costal fold extending to one-third of costa, apex rounded, termen oblique, tornus obtuse, anal margin straight, ground color dark fuscous, mixed with light grey and whitish suffusions, termen and tornal area with a broad irregular whitish patch, with four black spots distally and two dark grey shades within, apex and termen with a broad dark brown line, first and last three costal strigulae well defined, well developed and broad, strigulae in the middle of costa ill-defined, apical cilia small, whitish, cilia on termen grey and fuscous, latter with whitish tips, tornal cilia long and whitish. Hindwing quadrate, broader than forewing, covered with dark grey scales, fringes with cilia grey having dark sub-basal shade. Prothoracic and mesothoracic legs with fuscous and yellow rings, metathoracic legs creamish.

Male genitalia (Fig. 8): Uncus small, furcate, apices dorso-laterally directed; socii moderate, drooping, sparsely hairy; tuba analis membranous; tegumen moderate, high, shoulders rounded; vinculum weak; juxta triangular, shield-like; valva moderate, strongly constricted almost in middle, costa strongly arched, basal excavation large, sacculus round, broad, bearing very fine setae, cucullus neck much narrower, top strongly dilated, oblique, hammer-shaped, both lobes almost of equal length and breadth, both lobes rounded, inner surface with long dense hair, distal margin with small stout setae; aedeagus small, broad, base globular, vesica with a bundle of long cornuti.

Female genitalia (Fig. 9): Papillae anales small, slender; anterior apophyses slightly longer than posterior; sterigma cup-shaped; seventh sternite finely granulated; ostium bursae moderate; ductus bursae moderately long and broad; corpus bursae large, globular, with two unequal signae, one a rectangular plate like with round corners, second a straight moderate horn; ductus seminalis arising almost in the middle, near a ring of sclerotization.

Material examined: Holotype: ♂ India, Himachal Pradesh: Dist. Sirmour; Renuka Lake, 740 m, 12.iv.1999.

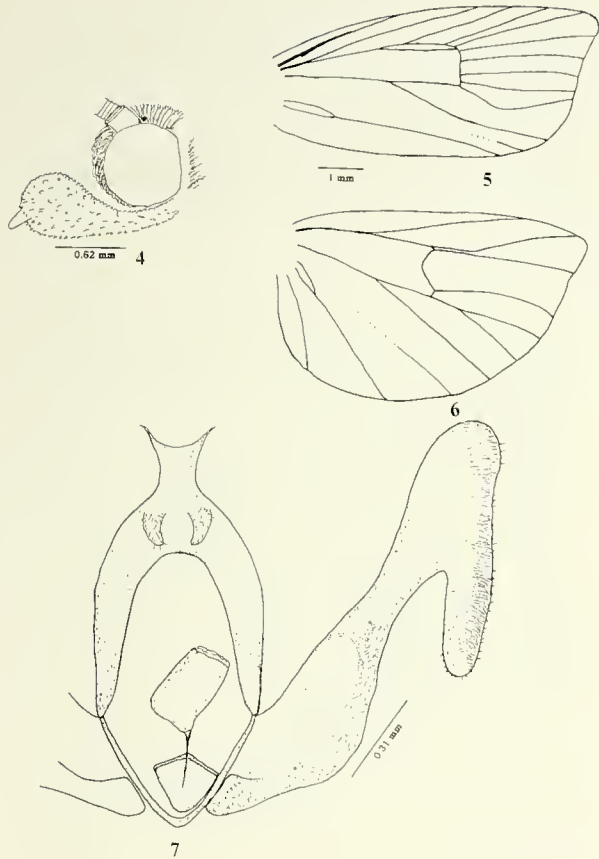
Allotype: ♀ India, Himachal Pradesh: Dist. Sirmour; Renuka Lake, 740 m, 13.iv.1999.

Remarks: *Lepteucosma alferdi* is similar to *L. oxychrysia* Diakonoff. However, it can easily be separated by differences in the male genitalia. In *L. alferdi* both the lobes of the cucullus are almost of equal length and breadth and are rounded, whereas, in *L. oxychrysia*, the upper lobe is almost twice broad as compared to the lower lobe.

Etymology: The species name is proposed after the name of Dr. J.R.B. Alferd, who is currently Director of the Zoological Survey of India, Kolkata, India.

Lepteucosma byuni
Pooni & Rose, new species

Male (Fig. 3). Wing expanse: 20 mm. Vertex and frons pale ochreous. Antenna fuscous, with yellow rings, flagellum with small white cilia ventrally. Labial palpus long, 2.5 times diameter of eye, whitish ochreous, second segment long, porrect, hardly upcurved, strongly expanded with scales on upper and lower side, third segment minute, pointed, slightly drooping. Thorax dark fuscous. Wings broad; forewing with costa gradually and gently arched throughout, a little abrupt expansion at basal one-fourth, male with costal fold, expanding up to one-third of costa, apex rounded, termen oblique, tornus



FIGS. 4-7. *L. ferruginoptera* new species, 4, Labial palpus, 5, Forewing venation, 6, Hindwing venation, 7, Male genitalia: Ventral view.

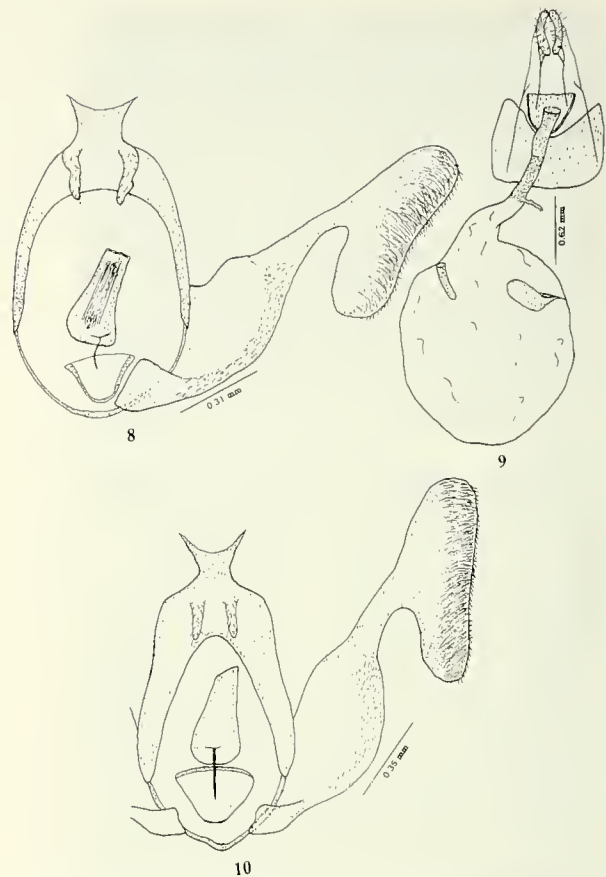
obtuse, anal margin straight, ground color dark fuscous, mixed with light grey and whitish suffusions, termen and tornal area with a broad irregular whitish patch, with four black spots distally and two dark grey shades within in, apex and termen with a broad dark brown line, only last two costal strigulae well defined, well developed and broad, remaining ill-defined, cilia on apex small, whitish, cilia on termen grey and fuscous, latter with whitish tips, tornal cilia long and whitish. Hindwing quadrate, broader than forewing, covered with dark grey scales, fringes with cilia grey having dark sub-basal shade. Prothoracic and mesothoracic legs with fuscous and yellow rings, metathoracic legs creamish.

Male genitalia (Fig. 10): Uncus small, bipartite, apices dorso-laterally directed; socii moderate, drooping, sparsely hairy; tuba analis membranous; tegumen moderate, high, constricted almost in middle, costa strongly arched, basal excavation large, sacculus rounded, broad, beset with very fine setae, cucullus neck much narrower, top strongly dilated, oblique, hammer-shaped, upper lobe longer and broader than lower, lower lobe somewhat pointed, upper rounded, inner surface with long dense hair, distal margin beset with small but stout setae; aedeagus small, broad, base globular, vesica without comuti.

Female genitalia: Unknown.

Material examined: Holotype: ♂ India, Himachal Pradesh: Dist. Kangra; SRH, Kangra, 800 m, 12.vi.1995.

Remarks: *Lepteucosma byuni* can easily be separated from the type-species *L. oxychrysis* Diakonoff as



FIGS. 8, 9. *L. alferdi* new species, 8, Male genitalia: Ventral view, 9, Female genitalia: Ventral view. FIG. 10. *L. byuni* new species, Male genitalia: Ventral view.

well as *L. alferdi* and *L. ferruginoptera* in having the upper lobe of the cucullus being longer and broader than the lower lobe. Also, the upper lobe is comparatively rounded and the lower somewhat pointed.

Etymology: The species is named in honor of Dr. B.K. Byun, a Korean Tortricid worker.

The presently examined material is deposited in the Lepidoptera Laboratory, Department of Zoology, Punjab University, Patiala, which has been recognized as a Coordinating Centre for undertaking research on microlepidoptera under an All India Coordinated Project on Taxonomy (AICOPTAX) by the Ministry of Environment and Forests, Govt. of India.

DISCUSSION

At present, the genus *Lepteucosma* Diakonoff is represented by eleven species including the three presently described as new. Conforming to the type-species, the critical evaluation of male genitalic characters shows that the uncus is small and bicornuate and the cucullus is strongly expanded and hammer-

shaped. The natural grouping of these species is also evident from the venation, particularly the unusual origin of vein R_1 in the forewing (Fig. 5). Unlike its usual origin from near the middle or beyond the middle of the discal cell, it originates from near the base of the wing in *Lepteucosma*. Also, the veins R_4 and R_5 are free and M_1 and M_2 are almost parallel to each other. The M-stem is absent in the forewing. In the hindwing (Fig. 6), the veins R_s and M_1 are closely approximated at the base and M_2 is bent towards the lower angle. The labial palpi in all the species are elongated and more than twice the diameter of the eye with the second segment being longer and strongly expanded with scales above and beneath. In proposing the genus, the author (Diakonoff, 1971) mentioned the presence of a moderate costal fold in the forewing but the same has been shown to be missing in the description of the type-species. The costal fold is well developed in the species presently described. It seems appropriate to mention here that while referring to the material ex-

amined, Diakonoff (1971) mentioned Gilgit as a part of Thailand; it has always been a part of India (Kashmir).

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LITERATURE CITED

- DIAKONOFF, A. 1971. South Asiatic Tortricidae from the zoological collection of the Bavarian State (Lepidoptera). Veröff., Zool. Staatssamml. München 15:167-202.

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